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Title : Diet differences in Steller sea lions by age and location based on fatty acid signatures

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Student : Not Applicable

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Abstract : Food-limitation, particularly that of juveniles, is one of the leading hypotheses for the decline of Steller sea lions in western Alaska. Recent estimates of diets have come from scat analyses and are not specific to young animals. We examined fatty acid signatures (FAS) of 179 individuals from Prince William Sound (PWS), Kodiak (KOD) and the Aleutian Islands (AL) to compare adult female and juvenile diets. Blubber biopsies were taken from 113 individuals in PWS ranging in age from 2 to 23 months and encompassing three seasons. In KOD and AL, 33 samples at each location were taken from 9-10 month old animals. Fatty acids were extracted using a modified Folch method and 68 fatty acids were identified using gas chromatography. The FASs of 9-10 month old pups differed significantly between locations (MANOVA: $F_{30,150}=13.216$, $p<0.001$), but not by sex ($F_{15,78}=1.609$, $p=0.091$) and there was no location by sex interaction ($F_{30,158}=1.397$, $p=0.98$). Since blubber FAS of suckling pups are derived from their mother's milk, they effectively reflect that of their mother's diet. These results indicate that the mothers of these pups consumed different diets at each location, but that diets did not differ depending on the sex of the pup. Within PWS, FASs differed significantly by season (MANOVA: $F_{18,200}=11.730$, $p<0.001$), age (pup (<11 mo.) vs. yearling (14-23 mo.); $F_{9,99}=25.425$, $p<0.001$) and showed a significant season by age interaction ($F_{18,200}=6.535$, $p<0.001$). The significant interaction reflects the fact that seasonal changes in diet differed between yearlings and lactating females: while lactating females' diets differed seasonally, yearlings' diets remained relatively constant. Because seasonal changes in prey availability and quality are documented, this suggests that in Steller sea lions, adult females respond to such changes while yearlings may not.